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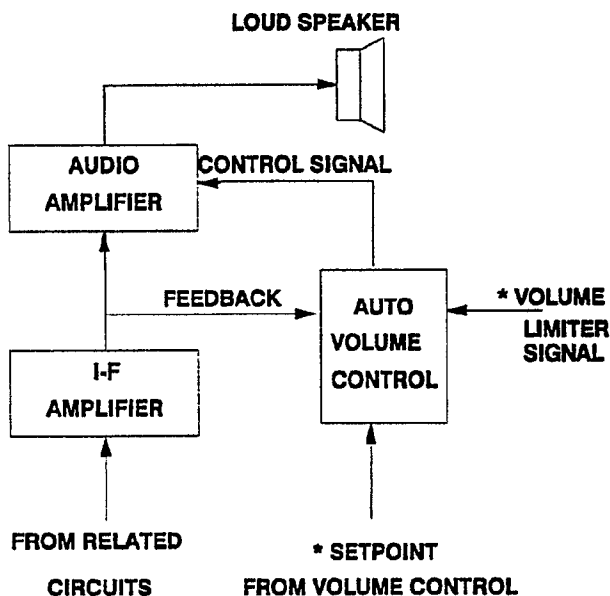
(56) Documents Cited  
GB 2204200 A GB 2019681 A GB 2004428 A  
GB 1330988 A WO 87/06072 A1

(58) Field of Search  
UK CL (Edition K ) H3G GPD GPDG GPDG GPDG GPXX  
GSX GTG GTS GTX  
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## (54) Electronic volume control system

(57) An electronic automatic volume control system for a radio or TV receiver wherein the volume level is controlled to a selected level in spite of variations in signal level introduced by external sources such as channel/station changes or interference. The time constant of response of the volume control system may be adjusted. A volume limiter avoids raising the volume above certain levels. The system may be integrated with the receiver circuitry and may use digital, analog or microprocessor based systems.

### PANEL E



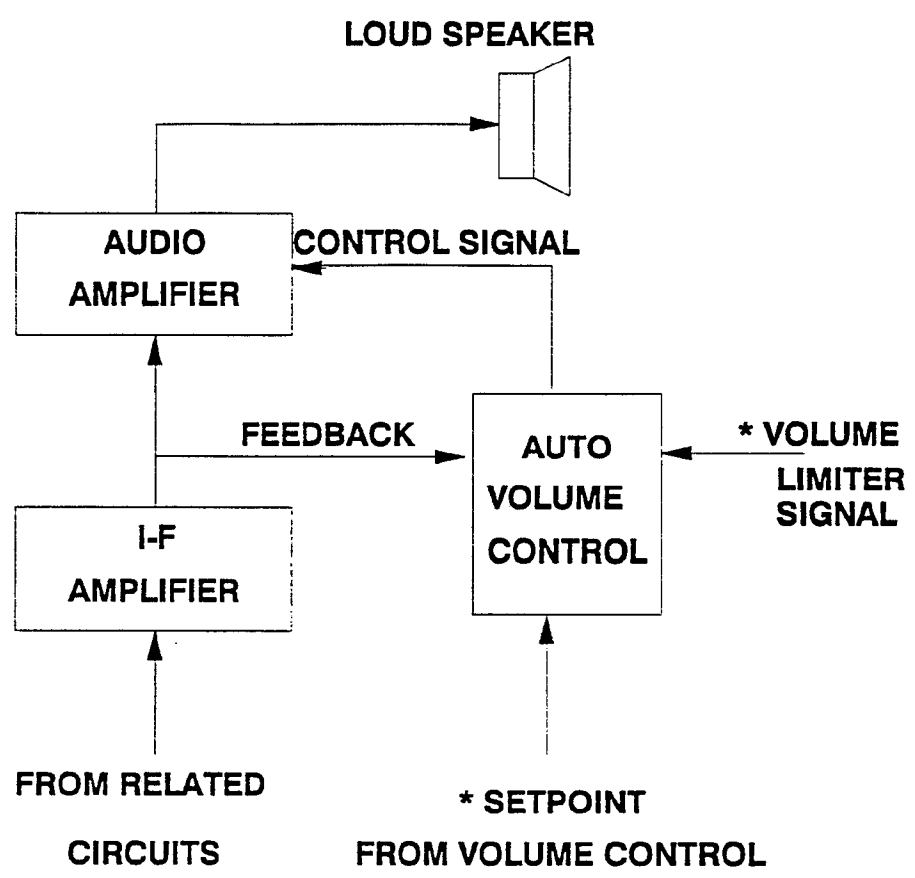
\* SET MANUALLY

### AUTO VOLUME CONTROL SYSTEM

FIGURE (1)

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PANEL E



\* SET MANUALLY

AUTO VOLUME CONTROL SYSTEM

FIGURE (1)

-1-  
**PANEL A**  
**AUTO - VOLUME CONTROL SYSTEM**

**TECHNICAL FIELD :**

THIS INVENTION PERTAINS TO AUDIO VOLUME CONTROL, IN ANY DEVICE USING AUDIO CIRCUITS DRIVEN BY EXTERNAL SOURCES SUCH AS TV AND RADIO SETS.

**BACKGROUND :**

THE PREVAILING VOLUME CONTROL CIRCUITS USED IN ALL RADIO AND TV SETS ARE BASED ON OPEN LOOP CONTROL DESIGNS. HENCE ANY CHANGE IN SOUND VOLUME CAUSED BY EXTERNAL FACTORS SUCH AS TRANSMISSION SYSTEMS , INTERFERENCE OR DISTORTION PROBLEMS PLUS CHANGES IN VOLUME CAUSED BY FREQUENT CHANGES OF STATIONS/CHANNELS IS A SOURCE OF NOISE AND ANNOYANCE TO OBSERVERS AND AUDIENCE DUE TO SUDDEN AND UNCONTROLLED CHANGE IN LEVEL OF SOUND (DECIBEL LEVEL) NEAR THE TV SET.

**TECHNICAL FEATURES :**

ACCORDING TO THIS INVENTION , THE NEW VOLUME CONTROL SYSTEM WILL USE FEEDBACK CONTROL TECHNIQUES TO ADJUST VOLUME LEVEL AND CONSEQUENTLY DECIBEL LEVEL OF THE SET SOUND . THIS TECHNIQUE WILL RESULT IN STEADY AND CONSTANT SOUND LEVEL OF THE SET WITHOUT MANUAL INTERVENTION FROM THE AUDIENCE , EVEN IN THE CASE OF CHANNELS CHANGING. THIS FEATURE WILL AVOID ANNOYANCE CAUSED BY SUDDEN INCREASE OR DECREASE OF TV SET VOLUME CAUSED BY CHANGES IN STATIONS/CHANNELS OR BY OTHER EXTERNAL FACTORS SUCH AS INTERFERENCE.

## PANEL B

### AUTO VOLUME CONTROL SYSTEM

REFERENCE THE CIRCUIT ATTACHED IN FIGURE (1) THE ACTUAL VOLUME LEVEL SIGNAL GOING TO THE AUDIO AMPLIFIER WHICH DRIVES THE LOUD SPEAKERS IN THE RADIO OR TV SET , IS MONITORED BY A NEW CIRCUIT CALLED AUTO VOLUME CONTROL CIRCUIT WHICH COMPARES THE ACTUAL VOLUME SIGNAL LEVEL TO THE SETPOINT OF VOLUME AS SET BY THE AUDIENCE FROM A VOLUME KNOB WHICH SETS A DECIBEL LEVEL PERCENTAGE .

HAVING THE 100% EQUAL TO THE HIGHEST DECIBEL LEVEL GOING OUT OF THE SET AT ANY CHANNEL AND VOLUME LEVEL SELECTED. THE SETPOINT RANGE OF THIS CIRCUIT SHOULD MATCH THE RANGE OF THE MEASURED SIGNAL GOING TO THE AUDIO AMPLIFIER. UPON COMPARING THESE TWO SIGNALS THE AUTO VOLUME CONTROL CIRCUIT WILL SEND A CONTROL SIGNAL PROPORTIONAL TO THE ERROR SIGNAL ( DIFFERENCE BETWEEN THE ACTUAL AUDIO SIGNAL LEVEL AND THE DESIRED ONE) TO THE AUDIO AMPLIFIER ADJUSTING ITS OUTPUT ACCORDING TO THE DESIRED LEVEL WANTED. THE CONTROL CIRCUIT WILL HAVE BESIDE GAIN CONTROL AN INTEGRAL ACTION ON THE ERROR SIGNAL TO CONTROL TIME CONSTANT OF RESPONSE.

ABOVE CIRCUIT CAN BE IMPLEMENTED USING VARIOUS ELECTRONIC COMPONENTS SUCH AS DIGITAL , ANALOG OR MICROPROCESSOR BASED SYSTEMS DEPENDING ON MANUFACTURERS' TECHNOLOGY USED IN THE SET. IT CAN BE USED WITH ANY TV OR RADIO SET AVAILABLE TODAY IN THE MARKET. THE BEST APPROACH TO ITS IMPLEMENTATION IS BY THE TV AND RADIO SETS MANUFACTURERS BY INTEGRATING IT WITHIN THE SET CIRCUITRY USING THE SAME COMPONENT TECHNOLOGY USED IN THE SET.

## PANEL C

### AUTO VOLUME CONTROL SYSTEM :

#### CLAIMS :

- 1- AN ELECTRONIC VOLUME CONTROL SYSTEM USING NORMAL ELECTRONIC COMPONENTS TO MONITOR AND CONTROL TV SETS AND RADIO SETS VOLUME LEVELS AND CONTROL IT AUTOMATICALLY TO CERTAIN SELECTED LEVELS AS EXPLAINED IN FIGURE (1) IN SPITE OF VARIATIONS IN AUDIO SIGNAL LEVEL INTRODUCED BY EXTERNAL SOURCES SUCH AS CHANNEL / STATIONS CHANGES OR INTERFERENCE.
- 2- AN ELECTRONIC VOLUME CONTROL SYSTEM AS CLAIMED IN -1- ABOVE WHERE THE TV AND/OR RADIO SET ACTUAL VOLUME LEVEL IS MONITORED CONTINUOUSLY AND COMPARED TO A SETPOINT (DESIRED VOLUME LEVEL) CONTINUOUSLY AND ACCORDINGLY CONTROLLING THE OUTPUT TO THE AUDIO AMPLIFIER WHICH CONSEQUENTLY MAINTAINS THE SOUND DECIBEL LEVEL AT CERTAIN DESIRED LEVELS.
- 3- AN ELECTRONIC VOLUME CONTROL SYSTEM AS CLAIMED IN CLAIMS -1- AND -2- ABOVE CAN BE USED IN ANY ELECTRONIC DEVICE WHICH HAS AN AUDIO CIRCUIT DRIVING LOUD SPEAKERS AND WHERE THE AUDIO SIGNAL LEVEL IS INFLUENCED BY EXTERNAL SOURCES .
- 4- AN ELECTRONIC VOLUME CONTROL SYSTEM WHICH HAS NECESSARY TUNING COMPONENTS TO ADJUST TIME CONSTANT OF AUDIO LEVEL CHANGE CURVE.
- 5- AN ELECTRONIC VOLUME CONTROL SYSTEM WHICH HAS VOLUME LIMITERS FOR THE VOLUME LEVELS SET MANUALLY TO AVOID RAISING THE VOLUME ABOVE CERTAIN LEVELS UNDER ANY CIRCUMSTANCES.

Examiner's report to the Comptroller under  
Section 17 (The Search Report)

GB 9220522.8

## Relevant Technical fields

(i) UK Cl (Edition K ) H3G GPXX, GSX, GTX, GTG, GTS,  
GPD, GPD, GPD, GPD)

(ii) Int Cl (Edition 5 ) H03G 3/20

## Search Examiner

B J EDE

## Databases (see over)

(i) UK Patent Office

(ii)

## Date of Search

21 DECEMBER 1992

Documents considered relevant following a search in respect of claims 1-3

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2204200 A (MOTOROLA) see 48, figure 2	1-3
X	GB 2019681 A (SAINT-GOBAIN INDUSTRIES) see figure 1	1-3
X	GB 2004428 (PLESSEY CO) see 9-13 figure 2	1-3
X	GB 1330988 A (TULL AVIATION) see 22, 24 figure 1	1-3
X	WO 87/06072 A1 (MOTOROLA) see 20, 20 figure 1	1-3